Children's Health Queensland

Research Impact Report 2022

Queensland Government

We're building and harnessing creativity, research, technology and collective expertise to prepare for the future.

Acknowledgement of Country

Children's Health Queensland Hospital and Health Service pays respect to the Traditional Custodians of the lands on which we walk, talk, work and live.

We acknowledge and pay our respects to Aboriginal and Torres Strait Islander Elders past, present and emerging.

We acknowledge the historical and contemporary impacts of Queensland's history of colonisation on the health and wellbeing of Aboriginal and Torres Strait Islander peoples.

We recognise the ongoing intergenerational trauma and racism experienced by members of the community.

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Message from the Chief Executive and Board Chair

Our research vision is to positively change the life trajectory of every child. In 2022, Children's Health Queensland made significant progress towards this goal and in cementing our position as a national and international leader in child and youth health research.

Despite the ongoing impact of COVID-19 on hospital and health systems internationally, our researchers' pursuit of innovation and discovery did not falter.

We achieved outstanding funding success in 2022, with a total of $45 million in grants awarded to Children's Health Queensland researchers. Congratulations to all our researchers on their discoveries and funding successes.

The reach of Children's Health Queensland research and expertise continues to grow with our teams involved in 799 international collaborations with leading institutions in 379 cities, across 97 countries.

This global recognition and impact are testament to the depth of paediatric research talent we have across our organisation, and our shared commitment to the best evidence-based care, service improvement, and outcomes for children and young people.

A great example of the important role of research in helping to improve understanding of common childhood conditions and treatments is Dr Jit Ale Magar's study into the pathophysiology behind intermittent exotropia, the most common form of childhood strabismus (see page 8). To determine the best treatment, Dr Ale Magar and his team developed and trialled an algorithm to customise the optimised minus lens power therapy. The study findings are having a significant impact among doctors and other eye care professionals who treat children with intermittent exotropia around the world.

Our Queensland Specialist Immunisation Service is collaborating with the Translational Research Institute on an Australian-first trial of a needle-free vaccination patch for children (page 14). This study has the potential to provide an improved vaccination experience for children who are anxious about the pain associated with needles. Given that needle phobia can stop children from getting vaccinations, this research could be a gamechanger in the childhood vaccination space.

In another world-first, our respiratory researchers have developed a clinical tool to track the effectiveness of treatment of respiratory infections in Aboriginal and Torres Strait Islander children (page 10), with the aim of reducing the likelihood of poor lung function and related disease in adulthood. With a benchmark for 'normal' healthy lung function for a First Nations child now available, respiratory outreach clinicians are better equipped to set children up for a healthier future.

During 2022 we revisited our overarching research strategy to ensure Children's Health Queensland's ongoing contribution to world-leading research and excellence in transforming health care is focused on contemporary need. We are pleased to report the Children's Health Queensland Research Strategy 2023-25 has been completed and endorsed and we look forward to sharing it with you in next year's report.

As we take this strategy forward, we acknowledge the contribution and legacy of the late Professor Alan Cripps, who sadly passed away in December 2022. Professor Cripps was a distinguished health and medical researcher whose work informed the way we care for children with respiratory infections. His appointment as Chair of the Children's Health Research Alliance in July 2019, helped bring together the 'best of the best' minds in paediatric research across Queensland. Professor Cripps articulated an ambitious vision for child health research in Queensland which we are committed to working toward.

With our future strategy in place, we are confident Children's Health Queensland is well placed to build and harness the expertise, innovation and clinical excellence that ensures we continue to deliver the best outcomes for children and young people in Queensland and around the world.

Frank Tracey Chief Executive

David Gow Board Chair

Children's Health Queensland Hospital and Health Service

2022 at a glance

146 research projects*

709 articles and book chapters published

56 new clinical trials

$45m grant funding received

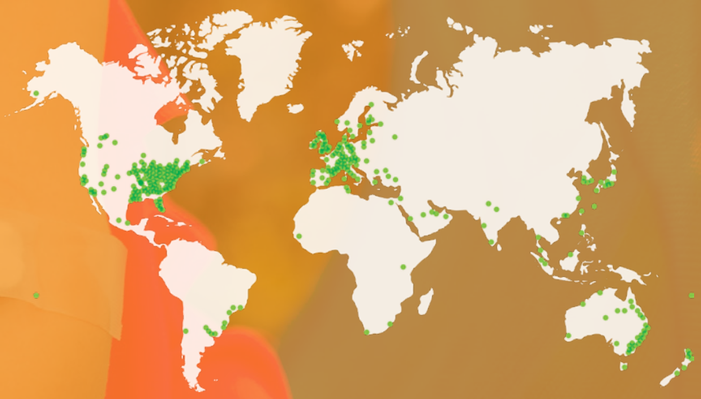
6,547 patients participated in clinical trials

$4m clinical trials income **

133 Human Research Ethics Committee approvals

$4.1m grant funding contributed *** or led by Children's Health Queensland researchers

799 international collaborations with leading institutions in **379** cities across **97** countries



*Total projects authorised by the Children's Health Queensland Research Governance Office.
**Funding includes grants administered by partner organisations.
***Funding income received at Children's Health Queensland as awarded grants or a proportion of grants administered by partner organisations.

Message from the Director of Research and Board Research Committee Chair

The value of medical research continued to take centre stage in 2022, as the world experienced another year of disruption and health challenges presented by the COVID-19 pandemic.

It was also the year that saw children and young people vaccinated against COVID-19, with parents and carers the world over demonstrating their trust in science and medical research to keep their families safe.

As we move out of the pandemic, we have an opportunity to continue to raise the profile of research and strengthen the translation of innovation and discovery into better healthcare and outcomes for children and young people.

The work of our researchers showcased in this report, from exploring the cause of childhood strabismus to trialling needle-free vaccinations, proves we have the passion, talent and drive to deliver positive and lasting change that benefits children globally. It's also further evidence of our people's ability to respond to contemporary needs and challenges.

The numbers speak for themselves. One hundred and forty-six new research projects were launched at Children's Health Queensland in 2022, covering some 37 NHMRC fields of research, with our researchers secured $45 million in grant funding.

Our research is always informed by the clinical needs of children and their families, and led by our clinicians, in collaboration with our academic, industry and community partners.

Our commitment to increase clinical trial activity, which facilitates access to novel therapies for children and young people, continues to bear fruit. In 2022, 56 new clinical trials commenced at Children's Health Queensland, across a broad range of medical, surgical, nursing and allied health specialty areas.

Our translational research capability is powered by the world-class clinical expertise we have at Children's Health Queensland, and building our research capacity and capability remains a priority. In 2022, 163 staff members held higher research degrees, and 73 supervised 120 higher degree students. This sharing of knowledge to nurture the next generation of multidisciplinary research leaders is vital to ensure we are prepared for today and tomorrow.

Finally, we'd like to acknowledge the contribution of the members of our various research committees and advisory groups (see page 22). It is with your generous sharing of time and knowledge that we are building Children's Health Queensland as a world-class health service of national and international significance, and, importantly, prioritising research that has the potential to change the lives of children everywhere.

We look forward to continuing to work with you to harness and amplify research to improve the lives of children, and nurture research excellence and careers in Queensland.

Associate Professor Andy Moore,
Director of Research

Heather Watson,
Board Research Committee Chair

Our strategy

Children's Health Queensland's research strategy is driven by our vision to lead life-changing care for children and young people - for a healthier tomorrow.

We know research has the potential to create life-changing advances in treatments, prevention, and outcomes for all. That's why our mission is to deliver translational research to drive evidence-based care, service improvement and innovation across Queensland and the world.

Children's Health Queensland Research Strategy 2018-2025

Prevention and early detection	Better care	Health services and systems research
Prevent disease and create healthcare for the future – building Queensland generations	Take our child health research and health services expertise to the world	Rapidly translate our research into better health outcomes using contemporary approaches including health economics, biostatistics and evaluation techniques

Our research strategy is evolving as our research programs mature. We are growing our funding and investment, and collaborating widely to build our research capacity and capability.

Our research enablers

Person-centred care

We consider children, young people and their families as true partners in their care, and place individual social, emotional, cultural, mental and physical care needs at the heart of a healthcare journey.

Our people

Our translational research capability is powered by the clinical expertise of our people who strive to be at the forefront of research, innovation, education and the application of evidence-based practice to improve health outcomes for children and young people.

Our partners

We collaborate with strategic partners across government, health, social services, education, research, private and non-government organisations to develop, share knowledge and translate innovation into practice.

Infrastructure

Our purpose-built infrastructure in the Queensland Children's Hospital precinct at South Brisbane encompasses the state's largest and only dedicated tertiary and quaternary paediatric hospital and the co-located Centre for Children's Health Research.

Statistical support and consultancy service

Our researchers have access to a biostatistics clinic and consultancy service provided by QFAB Bioinformatics, where researchers can access assistance in all aspects of project design, analyses and reporting as well as support for grant applications.

Areas of research

In 2022, Children's Health Queensland researchers worked across **37** fields of research.

- Aboriginal and Torres Strait Islander health
- Adolescent health
- Allergy
- Anaesthesia
- Arthritis and musculoskeletal
- Autoimmune disorders
- Blood disorders (non cancer)
- Bowel disorders
- Cancer and other malignant neoplasms
- Cardiovascular disease
- Child health
- Congenital abnormalities
- Health services research
- Cystic fibrosis
- Diabetes mellitus
- Emergency medicine
- Endocrine and metabolic conditions
- Fetal development
- Genitourinary disorders/kidney disease
- Hearing and related issues
- Human development
- Human genetics and genomics
- Infectious and parasitical diseases
- Injury related issues
- Intensive care
- Mental health
- Neonatal conditions
- Nervous system disorders (neuroscience)
- Pain and pain management issues
- Physiotherapy
- Public and population health
- Respiratory conditions (including asthma)
- Sleep disorders
- Speech and language disorders
- Surgery
- Vision sciences and ophthalmology
- Women's health

Taking a closer look at the cause of childhood strabismus

Researchers at the Queensland Children's Hospital are unlocking the secrets behind intermittent exotropia, the most common, yet poorly understood, type of childhood strabismus.

About two per cent of children aged under 10 years develop strabismus, a condition where the eyes do not line up in the same direction (often referred to as 'lazy eye', 'cross-eyed' or 'squint'). Intermittent exotropia, where one or both eyes intermittently turn outward, presents in up to 70 per cent of cases.

One of the most common non-surgical treatments for this type of strabismus is overminus lens therapy. This method involves prescribing additional minus glasses to their actual refraction to encourage the wearer to put extra effort in focusing their eyes, which in turn forces the eye muscles to bring the eyes into straight position.

Queensland Children's Hospital senior orthoptist Dr Jit Ale Magar (pictured right), said despite being the most common type of strabismus, the pathophysiology behind intermittent exotropia was poorly understood.

"There are a lot of pathophysiological mechanisms responsible for the tendency of intermittently outward turning of the eyes. It may also be associated with disrupted coordination between the eyes and the brain," Dr Ale Magar said.

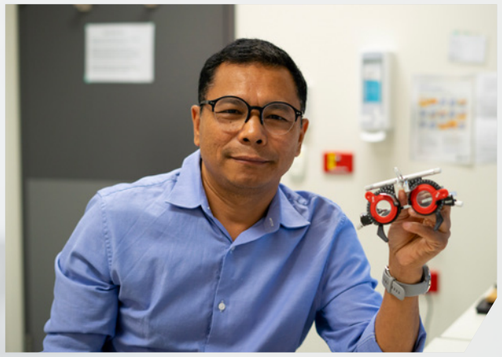
To determine the best treatment method for intermittent exotropia, Dr Ale Magar's team conducted a randomised clinical trial involving 132 children at the Queensland Children's Hospital between 2018 and 2021.

Children aged four to 15 years who were receiving treatment at the hospital for intermittent exotropia, as well as patients referred from external practices, were randomly assigned to control and overminus groups.

A novel algorithm was then developed to customise the optimised minus lens power for children in the overminus group. The algorithm encompasses all possible clinical factors responsible for the strabismus. This is the first attempt to use such clinically plausible algorithm in calculating individualised doses of overminus lens in the treatment of intermittent exotropia.

The results, published in Clinical and Experimental Ophthalmology in June 2022, showed the customised lenses prescribed through the novel algorithm were highly effective in controlling the deviation in intermittent exotropia.

The trial also evaluated if overminus lens therapy in intermittent exotropia caused myopia (short sightedness). The results, published in British Journal of Ophthalmology in June 2022, found the therapy does not affect the natural course of how the eye grows and therefore, is safe.



Dr Ale Magar said the findings would have a significant impact among doctors and other eye care professionals who treat children with intermittent exotropia around the world.

"People are still working to get to the bottom of the condition and treatment," he said.

"I want to continue working in this area so we can further improve the treatment outcomes for children."

The customised overminus lens calculation method is now embedded at the Queensland Children's Hospital as the standard approach for prescribing overminus lens.

The ophthalmology team is now developing an online calculator using the algorithm so it can be used by practitioners everywhere.

Optimised minus lens overcorrection for paediatric intermittent exotropia: A randomised clinical trial. *Clinical and Experimental Ophthalmology*. 2022 Feb 11; 50: pp 407-419. DOI: 10.1111/ceo.14060

Comparison of biometric and refractive changes in intermittent exotropia with and without overminus lens therapy. *British Medical Journal Opthalmol*. 2022 July 6; doi:10.1136/bjophthalmol-2022-321509

Customised lenses prescribed through the novel algorithm were highly effective in controlling the deviation in intermittent exotropia

A benchmark for lung function in First Nations kids

A world-first study by Children's Health Queensland respiratory researchers has delivered an accurate measure of lung function in Aboriginal and Torres Strait Islander children as they grow.

The clinical tool can be used to track the effectiveness of treatment of respiratory infections in childhood, with the aim of reducing the likelihood of poor lung function and related disease in adulthood.

Aboriginal and Torres Strait Islander peoples are 2.5 times more likely to develop a chronic respiratory condition compared to non-Aboriginal and Torres Strait Islander people.

As part of his PhD research with Queensland University of Technology respiratory scientist Andrew Collaro investigated how the lung function of Aboriginal and Torres Strait Islander peoples tracked over time to evaluate the benefit of paediatric respiratory outreach care.

"We chose lung function to evaluate the outreach service model, because establishing a 'normal' healthy lung function for a child helps us to best set them up for adulthood," Mr Collaro said.

"If you have poor lung function in childhood, the overwhelming odds are that it will be poor in adulthood and that increases your risk of all sorts of things – respiratory disease, cardiovascular disease and all-cause mortality."

The Children's Health Queensland cough and airways research group, led by Professor Anne Chang, assessed the lung function of more than 1,400 healthy Aboriginal and Torres Strait Islander children and adults over an eight-year period.

The team also partnered with the Telethon Kids Institute in Western Australia to recruit children and adults living in the Kimberley and in Perth.

Participants, ranging in age from three to 91 years, underwent a fractional exhaled nitric oxide test (asthma screening) and spirometry testing to establish reference values.

"Previous reference values for First Nations people didn't exclude behavioural and physical outliers such as smoking and obesity," Mr Collaro said.

"This was the first study to recruit participants outside of respiratory clinics – we wanted to include healthy lungs as well.

Fractional exhaled nitric oxide reference values were published in Chest in October 2022, with the reference values for spirometry forthcoming.

In addition, Mr Collaro looked at the effect early childhood respiratory infection had on lung function in childhood and then in adulthood, in the first systematic review of its kind.

"In the first five years of life, there's a lot of growth happening both in the airways and in your lungs and because there's a lot of growth happening, the theory was always that you're extra susceptible to infections," Mr Collaro said.

"So if you have an infection in early childhood when all this growth and development is happening, does that affect you later in life, is there lasting damage? The answer is yes."

Mr Collaro said more evidence was needed from non-Western countries to understand the true impact of lower respiratory infections on lung development.

"This review uncovered that the data available on lung function after early childhood infection is from affluent European countries and countries in North America where the problem is not as significant," he said.

"We don't actually know much about what's going on in those areas where early childhood infection is at its worst."

The study also recommended the creation of age- and height-adjusted reference values be considered for other ethnicities.

Association of gas diffusing capacity of the lung for carbon monoxide with cardiovascular morbidity and survival in a disadvantaged clinical population. *Lung*. 200. 1-10. DOI:10.1007/s00408-022-00580-9

Developing fractional exhaled nitric oxide (FeNO) predicted and upper limit of normal values for a disadvantaged population. Chest. DOI:10.1016/j.chest.2022.10.014

Slowing the progression of cystic fibrosis

Anti-inflammatory therapy has been proven to help slow the progression of cystic fibrosis in infants and children.

The Queensland Children's Hospital was among eight cystic fibrosis services to participate in a world-first randomised controlled trial of azithromycin, a macrolide antibiotic with anti-inflammatory properties.

Between June 2012 and July 2017, 130 newborns (three to six months) with cystic fibrosis received either 10 mg/kg bodyweight of azithromycin orally three times per week or a matched placebo until age 36 months.

Participants underwent 13 study visits throughout the trial, as well as chest CT scans at age 12 months and 36 months.

The trial found the azithromycin treatment did not reduce the extent of structural lung disease but did reduce airway inflammation, morbidity including pulmonary exacerbations in the first year of life and hospitalisations. The medication also improved some clinical outcomes associated with cystic fibrosis lung disease.

The effect of azithromycin on structural lung disease in infants with cystic fibrosis (COMBAT CF): a phase 3, randomised, double-blind, placebo-controlled clinical trial. Lancet Respiratory Medicine. 2022 Aug; 10(8):776-784. doi: 10.1016/S2213-2600(22)00165-5.

Changing mindsets about Down Syndrome and sleep disorders

A study of sleep difficulties in children with Down Syndrome has revealed more needs to be done to empower families with the knowledge that sleep disruption isn't just something they have to live with.

Children with Down Syndrome are six times more likely to be at risk of having sleep disordered breathing. Their sleep can also be impacted by the social environment, brain abnormalities, medications, disruptions to routine and parental stress.

Although treatment is available, world-first research led by Queensland Children's Hospital paediatric respiratory and sleep physician Jasneek Chawla found many families were not asking for help with their child's sleeping issues, because they saw them as normal for a child with Down Syndrome.

The study also identified a need for greater understanding among primary care physicians that sleep difficulties in children with Down Syndrome can be effectively treated.

Dr Chawla's study asked 30 parents who attended the Queensland Children's Hospital sleep clinic with their child what it was like caring for a child with Down Syndrome, including questions about their own experience with sleep and the health care system.

Dr Chawla said the interviews highlighted how much of a struggle it was for the families and how important sleep was to the way families functioned as a whole.

"It really showed us that a child not sleeping, who also has a disability, has a massive negative impact on the parents' ability to cope with that child and to function in everyday life," Dr Chawla said.

"We had families tell us how socially isolated they felt because they were so tired, how they didn't have the patience they wish they could have with their child because they were too tired themselves.

"We heard stories of parents neglecting their own wellbeing – feeling like they couldn't exercise or do things for themselves. This was linked to looking after a child with a disability and looking after a child in general."

"The way they manage this is to normalise it; to say that 'this is actually a normal part of life for us and we just have to accept that our child doesn't sleep well'," she said.

"That's not actually what they should be feeling like.

"Something is going wrong here – we really need families to understand that they can reach out for help in getting their child to sleep."

Dr Chawla said treatment was available for sleep difficulties and families who accessed it felt it greatly improved their quality of life.

However, the study also showed families who had previous negative interactions with the health care system, particularly parents who were offered a termination after the prenatal screening, did not consider seeking help.

"What we're finding, especially with sleep, is because it's something people are normalising and thinking that is what they should expect for a child with Down Syndrome, if they've had negative experiences with healthcare, they don't seek support," Dr Chawla said.

"We need to help primary care physicians understand that sleep difficulties in children with Down Syndrome should not be dismissed."

As a result of the study, Dr Chawla's team worked with Down Syndrome Queensland to create fact sheets and webinars about different aspects of sleep in children with Down Syndrome to assist families and medical professionals.

The findings of the study were published in *Behavioural Sleep Medicine* in November 2022 and in *Health Sociology Review* in early 2023.

Dr Chawla's team is also preparing to publish a paper on what it's like to be the sibling of a child with Down Syndrome with sleep problems, based off sibling interviews conducted at the same time as the parent interviews.

Dr Chawla's research was supported by a Queensland Health Advancing Clinical Research Fellowship.

Parents' experiences of having a child with Down Syndrome and sleep difficulties. *Behavioral Sleep Medicine*, November 2022. DOI: 10.1080/15402002.2022.2143359

We need families to understand that they can reach out for help in getting their child to sleep

A step closer to needle-free vaccinations

The Queensland Specialist Immunisation Service (QSIS), based in the Queensland Children's Hospital, is delivering an Australian-first trial of a needle-free vaccination patch for children.

QSIS launched the trial in September 2022 in partnership with Brisbane-based biotechnology company Vaxxas and the Translational Research Institute.

The trial is exploring how children aged between 6 and 24 months respond to the patch, and how it is tolerated on skin.

The patch was dry coated with an excipient that was not a vaccine but enabled researchers to see how well the patch transferred the coating onto the skin.

The needle-free patch, developed by Vaxxas, is covered in thousands of microscopic spikes that penetrate less than a millimetre into the upper layers of the skin.

The patch is housed in a small, circular device with a foil lid. To apply, the lid is removed and the exposed patch is held against the skin. The applicant then presses a trigger on the device, which presses the patch into the skin.

The device is held in place to ensure the dry-coated vaccine is absorbed.

Families attend the Centre for Children's Health Research in South Brisbane for an initial screening and physical examination before the patch is applied.

The child's parent or guardian also receives the patch so they can understand what their child experiences.

The site of the patch's application is photographed and the parent or guardian is interviewed about the experience. Follow-up interviews and additional site checks are conducted on day 7 and day 28.

Nurse researcher Rebecca Doyle said a key benefit of the patch was that it does not cause the numbness or soreness that some people feel when receiving a traditional intramuscular injection.

"Some children and young people tell us they don't like the sensation of fluid being injected into the muscle," Ms Doyle said.

"The patch doesn't create that sensation. It feels more like a flick of a rubber band."

Another key benefit of the patch is the improved vaccination experience for children who are anxious about the pain associated with needles.

Needle phobia can stop children and adults from getting the vaccinations they need, which leaves them vulnerable to preventable diseases. It is estimated up to quarter of adults have a genuine phobia of injections and this number may be higher in children.

"QSIS receives many referrals for children and young people with needle phobia and procedural anxiety," Ms Doyle said.

"Often, they can't be vaccinated safely in the community and require very specific and individualised care to support vaccination."

The patch was trialled in young children in 2022. Previous trials of the patch in adults have found there is an enhanced immune response due to administration into tissue in and under the skin that is rich in immune cells.

The patch also has the potential to overcome the challenge of maintaining cold chain because the dry-coated vaccine may not require continuous refrigeration. This could result in easier storage and transport in hot climates without the risk of damaging or destroying the vaccine.

The patch design also eliminates the risk of needlestick injuries.

Research into the patch's success in children is ongoing, but it could be commercially available for use in adults within the next three years.

"This collaboration has been a valuable opportunity to advance the technology of vaccine administration and translating research evidence into improved health care," Ms Doyle said.

Better surgical care for cardiac kids

Infants with congenital heart disease do not benefit from the use of nitric oxide via cardiopulmonary bypass during cardiac surgery, an international study led by Queensland Children's Hospital researchers has found.

About 1 in 100 children are affected by congenital heart disease, with about a quarter of those requiring corrective surgery in their infancy.

A randomised trial of 1,372 children (under two years) examined whether nitric oxide delivered into the cardiopulmonary bypass oxygenator during heart surgery affected the number of ventilator-free days.

The trial found children who received the nitric oxide did not have more ventilator-free days compared to children who received the standard care.

Effect of Nitric Oxide via Cardiopulmonary Bypass on Ventilator-Free Days in Young Children Undergoing Congenital Heart Disease Surgery: The NITRIC Randomized Clinical Trial. JAMA. 2022 Jul 5;328(1):38-47. doi: 10.1001/jama.2022.9376.

Needle phobia can stop children from getting the vaccinations they need, which leaves them vulnerable to preventable diseases.

Living better with diabetes

Children and young people with type 1 diabetes, and their families, are enjoying improved health and quality of life thanks to subsidised continuous glucose monitoring (CGM).

A CGM device provides a measure of a person's blood sugar levels in real-time via a sensor – placed just under the skin of the arm or stomach – which sends readings to a wireless receiver, insulin pump or compatible smartphone or smart device. The system virtually eliminates the need for finger pricks.

In April 2017, the Australian Government started fully funding CGM devices for people aged under 21 years with type 1 diabetes.

Without the National Diabetes Services Scheme CGM subsidy, the annual cost of a CGM device is more than $5,000, a price out of reach for many families. As a result, less than 5 per cent of people under 21 years old were using the devices prior to the subsidy.

Queensland Children's Hospital endocrinologist Stephanie Johnson was part of the Australian CGM Working Group that provided regular reviews on the effectiveness of the rollout.

The working group collected and analysed data from patients of major teaching hospitals whose data was submitted to Australasian Diabetes Database Network (ADDN) between April 2016 and December 2019.

They found children and young people who used a CGM device were two and half times more likely to achieve an HbA1c (glycated haemoglobin blood test) result within the target range (less than 7 per cent blood glucose), and the rate of participants who recorded an HbA1c level of more than 9 per cent decreased by two thirds.

The study also found metabolic control (as measured by HbA1c) improved on average by 0.8 per cent in those who continued to use the device — a 1 per cent drop in HbA1c halves the rate of microvascular complications like kidney disease and eye disease.

"Clinically what we see through patients' experiences is that this is absolutely life changing," Dr Johnson said.

"A lot of these kids had never had a sleepover because their parents were too scared to let them go anywhere.

"Parents are also getting more sleep; usually the parents would have to get up and do a finger prick every night at 2am – they don't have to do that anymore.

"The quality of life is so much better for people and their families when they're on the sensors."

The population-based study, published in *Diabetes Care* in February 2022, was the first time the real-world effect of the device could be examined without socioeconomic bias.

In addition to the health improvements, the study reported uptake of the devices skyrocketed to 79 per cent following the introduction of the subsidy.

In 2022, the Australian Government expanded the subsidy to include people aged over 21 with type 1 diabetes.

Universal Subsidized Continuous Glucose Monitoring Funding for Young People With Type 1 Diabetes: Uptake and Outcomes Over 2 Years, a Population-Based Study. *Diabetes Care*. 2022 Feb 1;45(2): 391-397. doi: 10.2337/dc21-1666.

> A lot of these kids had never had a sleepover because their parents were too scared to let them go anywhere... Parents are also getting more sleep.

Exploring link between ASD and gut health

The symptoms of autism spectrum disorder (ASD) could be improved by targeting gut-derived metabolites with an oral adsorbent.

Gastrointestinal issues are common in children with ASD and previous studies have identified differences in their gut microbiome.

To further investigate this a group of international researchers, including Queensland Children's Hospital Medical Director of Child Development Professor Honey Heussler, assessed the safety and tolerability of oral GI-restricted adsorbent AB-2004, a high-surface-area spherical carbon adsorbent.

A clinical trial of 27 adolescents in Australia and New Zealand found the medication had good safety and tolerability across all dose levels with no severe adverse events.

Surprisingly, the trial also identified improved symptoms associated with ASD, including reduced anxiety and irritability after eight weeks of treatment.

Participants' decreased anxiety continued after treatment ceased while their levels of irritability returned to pre-treatment levels.

The study suggested larger placebo-controlled trials should take place to further explore the targeting of gut-derived metabolites with an oral adsorbent for children with ASD.

The results of the trial were published in *Nature Medicine* in February 2022.

Safety and target engagement of an oral small-molecule sequestrant in adolescents with autism spectrum disorder: an open-label phase 1b/2a trial. Nature Medicine 28, 528–534 (2022). https://doi.org/10.1038/s41591-022-01683-9

Leading the world in burns first aid

Queensland Children's Hospital research is being used to transform burns treatment across America.

In 2022, researchers from Children's Health Queensland and Griffith University partnered with the United States Department of Defense for a four-year transnational project.

The project, led by Queensland Children's Hospital research fellow and Griffith University Associate Professor Bronwyn Griffin (pictured), will work with emergency and healthcare organisations in the US to implement the best practice of applying cool running water for 20 minutes within the first three hours of a burn.

Treating burns with cool running water for 20 minutes was established as best practice in 2011 by Queensland researcher Leila Cuttle from the Centre for Children's Burns and Trauma Research.

It has since been widely adopted by first aid, paramedic and healthcare organisations across Australia, New Zealand, the United Kingdom and Europe.

In 2019, Associate Professor Griffin, a former paediatric emergency nurse, led a study that consolidated early findings of how the intervention impacted the outcomes of the child's burn recovery. The study looked at the treatment of 2,495 children at the Queensland Children's Hospital over three years.

The study found children who had 20 minutes of cool running water applied for up to three hours after an injury were 40 per cent less likely to need a skin graft.The treatment also reduced the severity of the burn and how long a child needed to stay in hospital.

The research was published in the prestigious American medical journal *Annals of Emergency Medicine* in 2019 and prompted the partnership with the US Department of Defense.

The US trial will target implementation through key stakeholder engagement and further test the clinical outcomes of this treatment.

"This is the biggest international burns trial led by Australia researchers," Professor Griffin said, "and certainly the first led by a nurse!".

To mark the start of the US trial, a delegation of 10 Californian clinicians, paramedics and fire chiefs visited the dedicated children's burns centre at the Queensland Children's Hospital in October 2022.

The research partnership is being funded by a US$1.5 million (A$2.3 million) grant from the US Department of Defense.

20 minutes of cool running water, applied up to three hours after an injury, can reduce the likelihood of a skin graft by 40%.

Best palliative care for all children

Children referred to palliative care are receiving improved and consistent quality of care thanks to a nationwide education program led by Children's Health Queensland.

The Quality of Care Collaborative Australia (QuoCCA) project was formed in 2014 with a grant from the Australian Government Department of Health and Aged Care to create a cohesive, national platform for paediatric palliative care education.

QuoCCA education has been provided in every state and territory to nearly 21,000 participants across nursing, medical, allied health and others including teachers, funeral directors and chaplains.

The education provided has included pain and symptom management, practical and emotional support and end of life care, and can be tailored to the patient's diagnosis, age and specific needs

QuoCCA clinical lead Anthony Herbert said QuoCCA allowed for local paediatric care services to provide an umbrella of support for all involved.

"Parents have been able to build partnerships with health professionals and their community to advocate for their whole family's needs," Dr Herbert said.

Penny Slater, program manager of Children's Health Queensland's Oncology Services Group, said evaluations of QuoCCA showed recipients were able to retain what they learned months after their education sessions and apply it to the care they provided.

"In the outcome survey six months after the education session, people particularly talked about improvements in the awareness of the network of care in the community such as what was available to helps those children and families," Dr Slater said.

"People also found it valuable learning how to talk to a family about palliative care, how to introduce that topic and how to navigate all those different aspects of working through that with families."

An evaluation published in Palliative Care and Social Practice in October 2022 found building capacity in paediatric palliative care in non-metropolitan areas through QuoCCA provided families and their children with a better quality of care, regardless of where they lived.

Building capability in paediatric palliative care and enhancing education through the voice of parents: the Quality of Care Collaborative Australia. Palliative Care & Social Practice. 2022; 16:1-14. doi:10.1177/26323524221128835

Awards and prizes

Children's Health Queensland researchers were recognised with a variety of awards and honours in 2022 for their transformational work.

Anne Chang

Woolcock Research Award of the Asian Pacific Society of Respirology for excellence in respiratory research.

Professor Chang's team was the first in the world to give a description of protracted bacterial bronchitis (PBB) and the paradigm linking to bronchiectasis. Her work has changed clinical practice nationally and internationally, and improved the management and outcomes of cough and bronchiectasis in children, including First Nations Australian children.

Professor Chang delivered the Woolcock Memorial Lecture on her work "Why improve the management of chronic cough in children through clinical care and research?" at the 26th Congress of the APSR in Seoul, South Korea in November 2022.

Helen Buntain, Greta Busch, Anne Chang, Julie Marchant, Ian B Masters, Tom Ruffles (co-authors)

Asia Pacific Society of Respirology 2022 Fukuchi Award for outstanding original research paper published in Respirology.

"Outcomes of protracted bacterial bronchitis in children: A 5-year prospective cohort study".

DOI: 10.1111/resp.13950

Dr Honey Heussler

Children's Health Queensland Excellence Awards Excellence in Research Award **for her extensive clinical work to identify gaps in patient treatment and use the Centre for Clinical Trials in Rare Neurodevelopmental Disorders to provide alternative treatment options to children and young people.** This work has also provided the foundation for a further, large-scale RCT trial for which Children's Health Queensland is the national lead.

Children's Health Queensland Surgical Research Symposium 2022

Maria Shilova

Best poster presentation for her study into the impact of genetic testing on diagnosis and management in a vascular anomalies service.

Amelia Bai

Best research/quality improvement study results presentation (completed study): 'Performance of deep-learning artificial intelligence algorithms in detecting retinopathy of prematurity: A systematic review' was published in the peer-reviewed Saudi Journal of Opthalmology in October 2022.

Erika Dulay

Best research/quality improvement study concept Presentation (in progress study): for research into improving adherence to the 6-4-1 preoperative fasting guideline in paediatrics.

Centre for Children's Health Research Awards 2022

Karissa Ludwig

Best physical poster: RNA sequencing from urinary stem cells for characterisation and diagnosis of primary bone fragility disorders.

Erika Dulay

Best physical poster: A co-designed fasting bundle to improve adherence to the 6-4-1 fasting guideline in paediatrics: A pre-post quasi-experimental study.

Spreading the word

The work of Children's Health Queensland researchers is contributing to better care, and health and wellbeing outcomes for children across Australia and internationally.

6,379 total mentions across academic, online and social media platforms

709 articles and book chapters published

Publications included:

- *JAMA*
- *Journal of Clinical Oncology*
- *Nature Medicine*
- *PLOS ONE*
- *Cochrane Database of Systematic Reviews*
- *Lancet Respiratory Medicine*
- *Lancet Microbe*
- *Journal of Experimental Medicine*
- *European Respiratory Journal*
- *BMJ Open*

Media

368 news items across **16** countries

5,964 social media mentions

Source: Altmetric.com

Committees and governance

Children's Health Queensland Board Research Committee

The Children's Health Queensland Board Research Committee provides oversight and recommends strategies to the Children's Health Queensland Board (CHQ Board) in relation to building long-term collaborations in research and enhanced clinical service delivery founded on sustainable partnerships. The Committee helps build expertise and guide engagement to ultimately position Children's Health Queensland as a world-class health service of national and international significance.

Membership 2022
Heather Watson Chair, CHQ Board member
David Gow, Chair of the CHQ Board
Cheryl Herbert, CHQ Board member
Suzanne Cadigan, CHQ Board member
Associate Professor Simon Denny, CHQ Board member
Associate Professor Frank Tracey, Chief Executive CHQ
Associate Professor Steven McTaggart, Executive Director Medical Services CHQ
Associate Professor Andy Moore, Director of Research CHQ
Professor Allan Cripps
Dr Sandra Pavey (until Mar 2022); Imelda Ryan (from Mar 2022) CHQ Business Manager Research.

Children's Health Research Alliance

The Children's Health Research Alliance is a joint venture between Children's Health Queensland and the Children's Hospital Foundation to identify research priorities for funding that align to childhood disease burden in Queensland and the research and service capabilities of Children's Health Queensland and its partners.

Membership 2022
Professor Allan Cripps AO, Independent Chair
Associate Professor Frank Tracey, Chief Executive CHQ
Associate Professor Andy Moore, Director of Research CHQ
Cheryl Herbert, CHQ Board member
Associate Professor Leanne Johnston, CHQ nominee
Lyndsey Rice, Chief Executive Officer, Children's Hospital Foundation (CHF) (from Mar 2022)
Sharon Houghton, CHF Board member
Nick Van Dyke, Director of Patient and Family Support CHF (from Dec 2022)
Olivia Jary, Acting Chief Executive Officer CHF (until Mar 2022)
Dr Michelle Hannan, CHF Board member (until Sep 2022)
Associate Professor Anna Lewis, Director of Research and Grants CHF (until Sep 2022)

Children's Health Queensland Research Council

The Children's Health Queensland Research Council is an advisory body, providing senior Children's Health Queensland research clinicians with an opportunity to inform and help deliver our strategic research priorities, in line with the overall health service strategy. This advisory group, chaired by Children's Health Queensland Director of Research Associate Professor Andy Moore, is made up of 121 senior clinician researchers representing the full spectrum of clinical services and departments, and members of the Children's Health Queensland's executive leadership team.

Human Research Ethics Committee

Children's Health Queensland's Human Research Ethics Committee (HREC) reviews the ethical and scientific validity of proposed research within the Children's Health Queensland Hospital and Health Service and in partner agencies across Australia. The HREC is certified with the National Health and Medical Research Council to conduct paediatric clinical trials (Phases I to IV), involving drugs and devices, interventional research, other health and medical research, mental health, justice health and paediatric population health research.

Membership 2022
Professor Alan Isles AM, Chair
Phillip Manitta (layperson)
Graham Hyde OAM PHF (layperson)
Paula Penfold AM, (layperson)
Michelle Carr (healthcare professional)
Michelle Bond (healthcare professional)
Rebecca Doyle (healthcare professional)
Hugh Miller (healthcare professional)
Reverend Robert Rogers (pastoral care provider)
Bobbie Gadsden (pastoral care provider/Aboriginal and Torres Strait Islander representative)
Alexandra Zollner (lawyer)
Ann-Maree Russo (lawyer)
Dr Helen Buntain (current researcher)
Associate Professor Paul Lee-Archer (current researcher)
Dr Craig McBride (current researcher)
Dr Helen Petsky (current researcher)
Dr Honey Heussler (current researcher)
Amanda Smith (Ethics Co-ordinator).

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